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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/514,928	02/28/2000	Peter J. Wilk	W07-428	9269

7590 08/04/2006

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EXAMINER
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JAWORSKI, FRANCIS J

ART UNIT	PAPER NUMBER
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3768

DATE MAILED: 08/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

. 09/514,928

Applicant(s)

WILK ET AL.

Examiner

Jaworski Francis J.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 13 - 21, 31, 33 - 35 and 46 - 49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31,33,34 and 47-49 is/are allowed.
- 6) ☒ Claim(s) 13 - 21, 35 and 46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2-28-02 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner. (*Informal lettering variously*)  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 35 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention, since it depends from cancelled claim 32 and therefore its intended scope is unclear.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13 – 21 and 46 (as amended in the May 12, 2006 amendment) are rejected under 35 U.S.C. 103(a) as being unpatentable over Wright et al (of record) in view of Wilk and Holmberg, of record.

Wright et al is directed to a method of ultrasound imaging including supplying and receiving ultrasound signals to and from a plurality of transducers, using for example a phased array format to perform three-dimensional fully electronic volumetric scanning

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with a two dimensional array , including in one embodiment (see col. 4 lines 40 – 45, cols. 6 – 7 bridging and col. 11 line 66 – col. 13 line 13) the performing of synthetic aperture imaging where a larger aperture is thus synthesized from smaller constituent apertures associated with a plurality of tissue scanning transmit events at succeeding times by coherently combining the structural data from these separate transmit events. Transmission de-multiplex switches 3 and transmit timing delays 7 as well as receive multiplex switches 4 and receive channel delays 7 support the aperture formations. The term 'phased array' inherently implies a fixed position array such that phasing may be accomplished regarding beam steering and focusing. Whereas Wright et al stated the use of a conventional phased array scanner without specifically teaching details of a carrier or substrate, it would have been obvious in view of Wilk for example to maintain spatial registry of elements using a flexible carrier with fixed transducer inter-spacings or a rigid transducer carrier as in Holmberg, in either case using water coupling including fluid coupling chambers as taught by Wilk, since phased array use is reliant upon fixed spatial mounting locations for the contributing transducers. In the case of claim 46, the aforementioned col. 19 passage in Wright et al considered together with aperture combining teachings is understood to refer to the use of the full rectangular dimensions of the two dimensional array for either 2D or three-dimensional synthetic aperture combination..

Wright et al otherwise uses frequency variation as called for in claim 19 between transmit beams in order to reduce grating lobes during the 3D data collection.

Claim 46 is also rejected under 35 U.S.C. 103(a) as being unpatentable over Wright et al in view of Wilk and Holmberg as applied to this claim above, and further in view of Kamiyama et al (US6186948) since if this claim language be construed as pertaining to a compositing of a three dimensional image from a 2D image as derived from a 1D array, it would have been obvious in view of. The latter col. 4 lines 14 – 40 to perform individual two dimensional scanning using a transducer row with or without using elevational elements for lens action as well as three-dimensional scanning using the full elevational dimension of the two dimensional array.

#### ***Allowable Subject Matter***

Claims 31, 33 – 34 and 47 – 49 are allowed.

Claim 35 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

#### **Response to Amendment Arguments**

Applicants' arguments that the references variously do not teach synthesis of a combined aperture for higher resolution is not well taken since the stated purpose of the patent is inter alia for synthetic aperture formation from smaller apertures, where larger aperture size improves resolution. Since phased array operations towards this purpose

in Wright et al require that the array radiators be positionally fixed during beam contribution on transmit and/or receive, the secondary teachings evidence that the incorporation of such arrays of electromechanical transducers onto rigid or flexible carriers with various fluid and membrane containments would have been well-known.

Additionally, it would have been obvious in Wright et al to composite a synthetic aperture from contributing apertures using 1D or 1.5D arrays since the Wright et al two-dimensional array is rectangularly configured and for 2D or 3D synthetic aperture compositing from sequential transmit events. Additionally the secondary reference evidences that it was known to build a 3D scan composited from linear array scanning with or without an elevational focusing.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

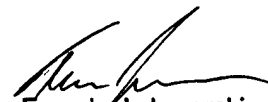
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any telephone communication concerning this correspondence should be directed to Examiner Francis J. Jaworski at phone number 571-272-4738.

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Francis J. Jaworski  
Primary Examiner